

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (currently amended): An adhesive composition, comprising:
at least one lignin component;
at least one amine compound; and
at least one boron compound,
wherein the adhesive composition is substantially formaldehyde-free and is substantially free of any compounds that degenerate to form formaldehyde.

Claim 2 (original): The composition according to claim 1 wherein the lignin component is derived from decayed lignocellulosic material.

Claim 3 (original): The composition according to claim 1 wherein the lignin component comprises an industrial lignin preparation.

Claim 4 (canceled).

Claim 5 (original): The composition according to claim 1 wherein the composition comprises from about 0.1% to about 5% of at least one boron compound or plural boron compounds by weight of the lignin component.

Claim 6 (original): The composition according to claim 1 wherein the amine compound comprises a polyamine.

Claim 7 (currently amended): A substantially formaldehyde-free adhesive composition, comprising:

solubilized decayed lignocellulosic material; and
at least one polyamine,
wherein the composition does not include a phenol-formaldehyde resin or a urea-formaldehyde resin.

Claim 8 (original): The composition according to claim 7 wherein the solubilized decayed lignocellulosic material is mixed with a boron compound to produce boron-modified solubilized decayed wood.

Claim 9 (original): The composition according to claim 8 wherein the boron-modified solubilized decayed lignocellulosic material comprises a reaction product of sodium borohydride and solubilized decayed lignocellulosic material.

Claim 10 (original): The composition according to claim 7 wherein the composition further comprises a borate.

Claim 11 (original): The composition according to claim 7 wherein the polyamine comprises polyethyleneimine.

Claim 12 (original): The composition according to claim 7 wherein the solubilized decayed lignocellulosic material comprises a lignin.

Claim 13 (withdrawn): A method for making a lignocellulosic composite, comprising:
contacting an adhesive composition according to claim 1 with at least a first lignocellulosic substrate; and
bonding the first lignocellulosic substrate to at least a second lignocellulosic substrate.

Claim 14 (withdrawn): The method according to claim 13 wherein the method comprises forming a pre-bonded assembly of the first lignocellulosic substrate, the adhesive composition, and the second lignocellulosic substrate; and

heating the adhesive composition to at least about 100°C.

Claim 15 (withdrawn): The method according to claim 13 wherein the first and second lignocellulosic substrates comprise lignocellulosic particles, and the contacting comprises mixing the adhesive composition with the lignocellulosic particles to form a pre-bonded assembly.

Claim 16 (withdrawn): A method for making a lignocellulosic composite, comprising:
contacting an adhesive composition according to claim 7 with at least a first lignocellulosic substrate; and

bonding the first lignocellulosic substrate to at least a second lignocellulosic substrate.

Claims 17-18 (canceled).

Claim 19 (currently amended): A substantially formaldehyde-free adhesive composition comprising a batch of the following ingredients that includes:

solubilized decayed lignocellulosic material;

at least one boron compound; and

at least one polyamine,

wherein the composition is substantially free of any compounds that degenerate to form formaldehyde.

Claim 20 (currently amended): A substantially formaldehyde-free adhesive composition comprising a batch of the following ingredients that includes:

solubilized decayed lignocellulosic material;

at least one reducing agent; and

at least one polyamine,

wherein the composition is substantially free of any compounds that degenerate to form formaldehyde.

Claim 21 (currently amended): A substantially formaldehyde-free adhesive composition

produced by:

mixing decayed lignocellulosic material with at least one boron compound; and
contacting the resulting mixture with at least one polyamine,
wherein the composition is substantially free of any compounds that degenerate to form formaldehyde.

Claim 22 (currently amended): A substantially formaldehyde-free adhesive composition produced by:

mixing decayed lignocellulosic material with at least one reducing agent; and
contacting the resulting mixture with at least one polyamine,
wherein the composition is substantially free of any compounds that degenerate to form formaldehyde.

Claim 23 (original): The composition according to claim 2, wherein the decayed lignocellulosic material comprises decayed wood.

Claim 24 (original): The composition according to claim 19, wherein the decayed lignocellulosic material comprises decayed wood.

Claim 25 (currently amended): A substantially formaldehyde-free adhesive composition comprising:

a mixture of at least one decayed lignocellulosic material and an alkaline aqueous solution; and
at least one polyamine,
wherein the composition is substantially free of any compounds that degenerate to form formaldehyde.

Claim 26 (original): The composition according to claim 1, wherein the boron compound is selected from boric acid, a boron salt, a borate ester, or a mixture thereof.

Claim 27 (original): The composition according to claim 1, wherein the lignin component

comprises demethylated lignin.

Claim 28 (original): The composition according to claim 26, wherein the lignin component comprises demethylated lignin.

Claim 29 (currently amended): A substantially formaldehyde-free adhesive composition comprising a batch of the following ingredients that includes:

demethylated lignin;

at least one boron compound; and

at least one polyamine,

wherein the composition is substantially free of any compounds that degenerate to form formaldehyde.

Claim 30 (original): The adhesive composition according to claim 29, wherein the boron compound is selected from boric acid, a boron salt, a borate ester, or a mixture thereof, and the polyamine comprises polyethyleneimine.

Claim 31 (withdrawn): A method for making a lignocellulosic composite, comprising:
contacting an adhesive composition according to claim 29 with at least a first lignocellulosic substrate; and
bonding the first lignocellulosic substrate to at least a second lignocellulosic substrate.

Claim 32 (canceled).

Claim 33 (new): The composition according to claim 1 wherein the composition does not include a phenol-formaldehyde resin or a urea-formaldehyde resin.

Claim 34 (new): The composition according to claim 21 wherein the composition does not include a phenol-formaldehyde resin or a urea-formaldehyde resin.

Claim 35 (new): The composition according to claim 29 wherein the composition does not include a phenol-formaldehyde resin or a urea-formaldehyde resin.